

CLAIMS

1. DNA comprising one or more genes specific for 5S clavam biosynthesis in *S. clavuligerus* and which is not essential for 5R clavam biosynthesis.

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2. DNA according to claim 1 as identified in Figure 1 (SEQ ID No: 1).

3. DNA according to claim 1 having the sequence or substantially the sequence shown in Figure 1 as orfup3, orfup2, orfup1, orfdwn 1, orfdwn2 or orfdwn3 (SEQ ID

10 Nos: 2-7).

4. DNA according to claim 1 having the sequence or substantially the sequence shown in Figure 1 as orfup1 (SEQ ID No: 4).

15 5. DNA which hybridises under conditions of high stringency with the DNA of claim 1.

6. A vector comprising the DNA of claim 1 in which one or more of the genes specific for 5S clavam biosynthesis has been disrupted or otherwise made defective.

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7. A vector according to claim 6 containing one or more defective genes which is pCEC060, pCEC061, pCEC056 or pCEC057.

8. A vector according to claim 7 which is pCEC061.

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9. A host containing the vector of claim 6.

10. A host according to claim 9 which is capable of producing raised levels of clavulanic acid.

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11. A host according to claim 9 which is capable of producing low or no levels of 5S clavam.

12. A host according to claim 9 which is *S. clavuligerus*.
13. *S. clavuligerus* comprising DNA corresponding to an open reading frame flanking cas1 which DNA has been disrupted or otherwise made defective.
14. *S. clavuligerus* according to claim 13 wherein the open reading frame is selected from the group consisting of orfup3, orfup2, orfup1, orfdwn1, orfdwn2 and orfdwn3.

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15. A process for improving 5R clavam production in a suitable microorganism comprising manipulation of DNA as defined in claim 1 and its inclusion in the microorganism.

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16. A process according to claim 15 wherein said suitable microorganism is *S. clavuligerus*.

17. A process for improving 5R clavam production in *S. clavuligerus* comprising disrupting or otherwise making defective DNA regions flanking cas1.

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18. A process according to claim 15 wherein said DNA corresponds to open reading frames selected from the group consisting of orfup3, orfup2, orfup1, orfdwn 1, orfdwn2 and orfdwn3.

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19. A process according to claim 15 wherein said DNA corresponds to open reading frame orfup1.

20. A process according to claim 15 wherein said 5R clavam is clavulanic acid.

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21. A process for the identification of a microorganism suitable for high 5R clavam production comprising a preliminary screening for microorganisms with low or no 5S clavam production.

22. A process according to claim 21 wherein the microorganism is *S. clavuligerus*.

23. A process according to claim 22 wherein the 5R clavam is clavulanic acid.

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24. A process according to claim 21 wherein one or more genes specific for the production of 5S clavams is defective.

10 25. A microorganism which is capable of 5R clavam production and low or no 5S clavam production obtainable by the process of claim 15.

26. A microorganism obtainable by the process of claim 25 which is capable of producing clavulanic acid but which does not produce clavam-2- carboxylate.

15 27. A microorganism obtainable by the process of claim 25 which is capable of producing clavulanic acid but which does not produce 2-hydroxymethylclavam.

20 28. A microorganism obtainable by the process of claim 25 which is capable of producing clavulanic acid but which does not produce clavam-2- carboxylate and 2-hydroxymethylclavam.

29. A microorganism obtained by the process of claim 15 which is strain 56-1A, 56-3A, 57-2B, 57-1C, 60-1A, 60-2A, 60-3A, 61-1A, 61-2A, 61-3A or 61-4A.

25 30. Clavulanic acid obtainable by the fermentation of a microorganism as defined in claim 25.

31. Clavulanic acid according to claim 30 which is free of clavam-2-carboxylate.

30 32. Clavulanic acid according to claim 30 in the form of its potassium salt.

33. Clavulanic acid which is free of any 5S clavam.

34. Clavulanic acid which is free of any clavam-2-carboxylate.
35. A composition comprising potassium clavulanate according to claim 32 in combination with a beta-lactam antibiotic.
36. A composition according to claim 35 in which the beta-lactam antibiotic is amoxycillin.
- 10 37. A process for the preparation of a composition comprising potassium clavulanate and amoxycillin which process comprises producing clavulanic acid from a microorganism according to claim 25 and thereafter converting it to the potassium salt and combining the potassium salt with amoxycillin.